

- **Metering with smallest possible rate capability**
- **High reproducibility**
- **High metering accuracy even with degassing products**
- **Self-priming and self-venting with smallest metering volumes**
- **Mechanical stroke adjustment**
- **Stroke frequency regulation**
- **Pulse control**
- **Pulse multiplication and division**
- **Pulse storage**
- **Standard signal drive**
- **Empty signal report and level pre-warning**
- **External metering lock**
- **Empty signal and stroke signal output**
- **Metering regulator (readjustment of metering output) in combination with an oval gear meter**



All metering pumps of the series ELADOS® EMP-KKS operate on the piston-diaphragm principle. The diaphragm serves to feed the product whereas the piston handles the metering. Because of the continuous surplus return this metering pump operates self-venting. Therefore, the pump is appropriate for the conveying of degassing products. The cylindrical piston system without seal

is made of ceramic material and offers maximum resistance to chemicals. Different electronic control variants allow the pump to be adapted to any process for quantity or proportional metering. The reasonable choice of accessories completes the extent of supply and represents a complete program for the metering application.



Technical Data:

Mechanical Data:

Pump capacity [l/h]:	0.2	0.5	0.9	1.4
Metering back pressure [bar]:	10	10	10	10
Piston diameter [mm]:	3	4.76	6.34	8
Delivery capacity per stroke [cm ³]:	0.027	0.068	0.12	0.19
Metering accuracy:	± 2%			
Suction height:	2 mWs, suction height with clean, slightly wet valves			
Metering frequency max:	122 1/min			
Pressure of pre-delivery max. [bar]:	0.3			
Suction and pressure valve (pre-delivery):	without spring			
Pressure valve (metering):	with 1 spring			
Ambient temperature max:	40° C			

Material:

Housing:	thermoplastic polyester
Pump head:	PVDF
Metering piston and cylinder:	ceramic
Diaphragm:	PTFE - EPDM compound diaphragm
Valve body:	PVDF
Seals:	FPM 602 (Viton B) optional: EPDM or Kalrez
Valve balls:	ceramic
Valve spring:	Hastelloy C22 PTFE-coated
Weight [kg]:	2.4
Colour:	blue RAL 5007

Special versions on request

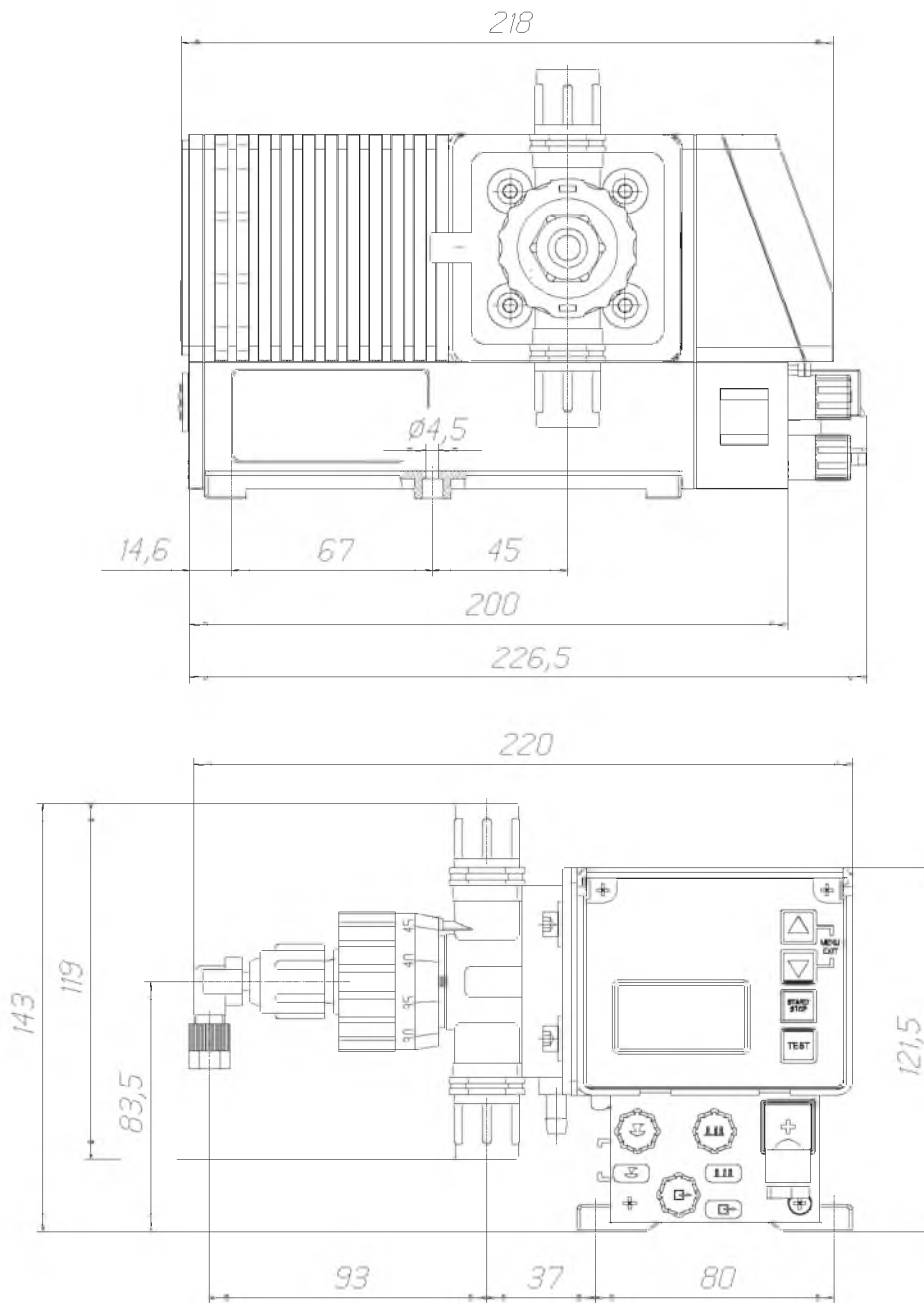
All values at 50 Hz. All data refer to water temperature of 20 °C according to the instructions of the technical manual, subject to!

Electrical Data:

Connection:	230 V / 50/60 Hz At a mains frequency of 60 Hz the delivery capacity increases by 20%, the metering back pressure decreases by 20% Special voltage on request
Power input [A]:	0,09
Current consumption [W]	
at 50 Hz:	18.7
at 60 Hz:	19.8
Safety type:	IP 65
Insulation class:	B
Protective class:	I

ATTENTION: Due to its principle, this appliance may only be used with a protective device against the pump running dry = empty signal device and suction lance. In the case of control variant E10 this function has to be guaranteed on the appliance side.

Dimensions:



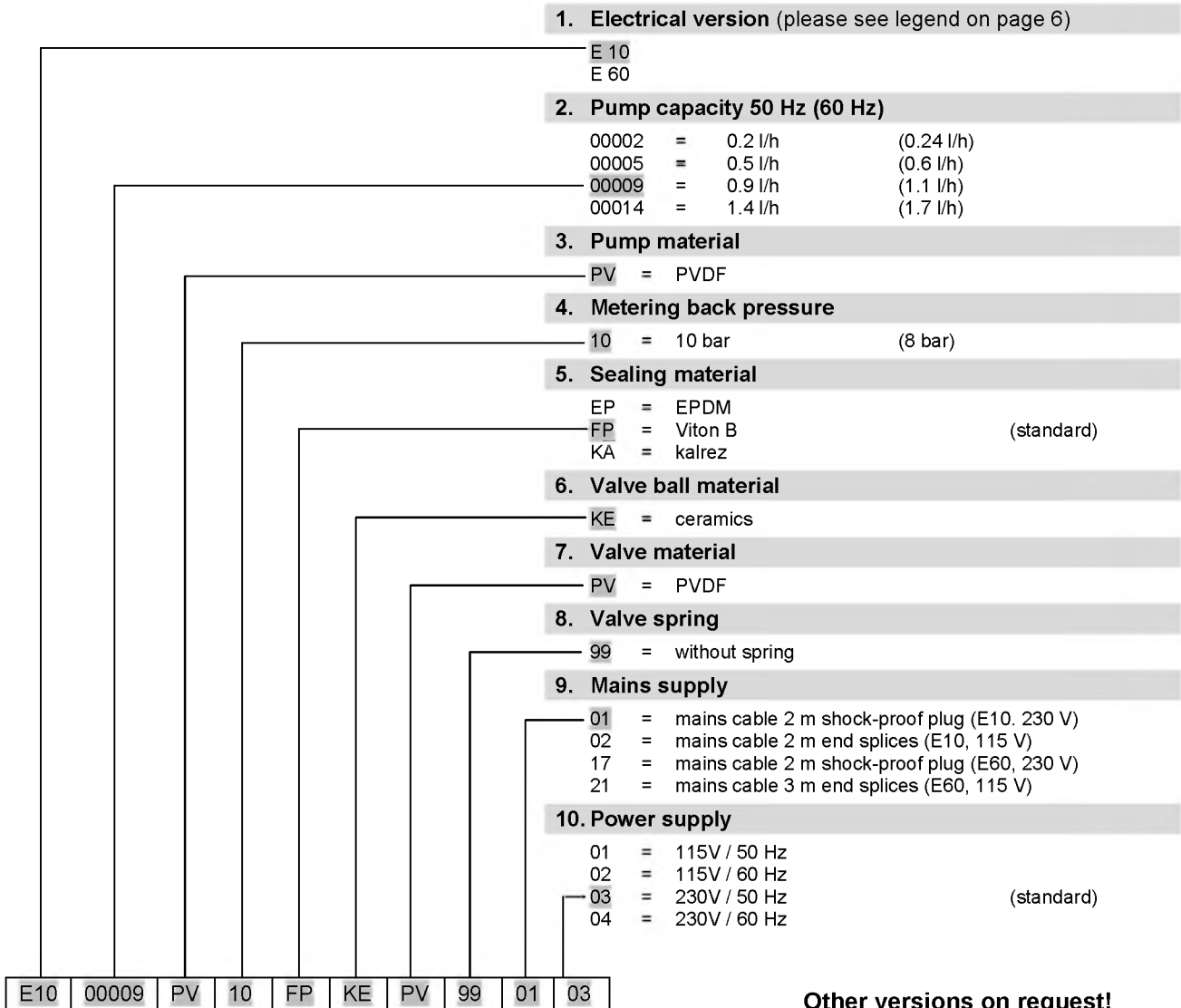
Hose connections	0.2 l/h	0.5 l/h*	0.5–1.4 l/h
Suction connection (int.Ø/ext.Ø):	6/10 mm	6/10 mm	6/10 mm
Return connection (int.Ø/ext.Ø):	6/10 mm	6/10 mm	6/10 mm
Pressure connection (int.Ø/ext.Ø):	2/4 mm	2/4 mm	4/6 mm

* For the connection of PE or PTFE hoses (2/4 mm) with the 0.5 l/h version is optional an angled connection [\(247613\)](#) available.

If metering units with EMP KKS pumps 0.2 and 0.5 l/h are operated with a very low metering rate or in combination with the monitoring system **micro flow**, the metering line should be carried out with 2/4 mm hoses.



Pump code – part 1





Pump code - part 2

11. Connection pre-delivery

- 04 = set for PE hose 6/8
- 05 = set for PVC hose 6/10
- 06 = set for PE-fabric 6/12
- 33 = set for hose 6/8, 6/10, 6/12 (standard)

12. Connection pressure side

- 31 = set bent for PE/PTFE hose 2/4 (standard for 0.2 l/h)
- 32 = set bent for PE/PTFE hose 4/6 (standard for 0.5 - 1.4 l/h)
- 34 = set bent for hose 2/4, 4/6

13. Connection material

- PV = PVDF

14. Electrical stroke adjustment

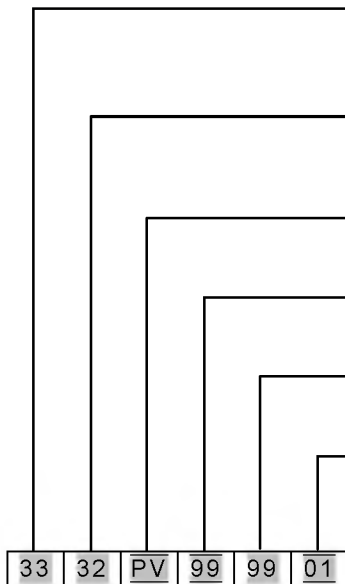
- 99 = without electrical stroke adjustment

15. Diaphragm failure detection

- 99 = without diaphragm failure detection

16. Housing version

- 01 = standard housing



Other versions on request!

Example of a complete pump code of a standard pump:

E10	00009	PV	10	FP	KE	PV	99	01	03	-	33	32	PV	99	99	01
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(Pump code 1)

(Pump code 2)



Electrical versions

E 10 On / off switch, mechanical stroke adjustment

- E 60**
- Mechanical stroke adjustment
 - Back-lit graphic display, 4 operating keys
 - Single stroke control (each stroke is completely executed)
 - Metering monitoring via stroke-signal output or via external metering-monitoring system (e.g. liquid level switch) possible
 - Registration of operating and consumption data (calculative)
 - Calibration function

Selectable operating modes:

Internal mode

Selection of metering rate/metering frequency via:

- Strokes/min
- Percent
- Liter/h (or gallon/h)

External mode

- Pulse mode (actuation via pulses)
 - Pulse multiplication (one incoming pulse = n metering strokes)
 - Pulse division (n incoming pulses = 1 metering stroke)
- Standard signal mode (actuation via external standard signal 0/4-20mA or 20-0/4mA)
- Charge mode (a previously selected quantity is metered, with initiation via an external initiation pulse)

Inputs:

- Level monitoring, package vessel (reserve and empty signal)
- Pulse
- Standard signal
- Enable (metering interlock)
- Metering control

Outputs:

- Level monitoring package vessel / malfunction
- Stroke signal



Ordering data – standard pumps:

Article	Pump code	Material-No.
ELADOS® EMP KKS	E10 00002 PV 10 FP KE PV 99 01 03 – 33 31 PV 99 99 01	147610
	E10 00005 PV 10 FP KE PV 99 01 03 – 33 32 PV 99 99 01	147710
	E10 00009 PV 10 FP KE PV 99 01 03 – 33 32 PV 99 99 01	147810
	E10 00014 PV 10 FP KE PV 99 01 03 – 33 32 PV 99 99 01	147910

Extent of supply: 2 m connector cable with shock-proof plug, operating instructions, material of hose connection 2/4 mm (0.2 l/h) resp. 4/6 mm (0.5 – 1.4 l/h) for pressure connection; 6/8 mm, 6/10 mm and 6/12 mm for pre-delivery, 2 m duo-hose,

ELADOS® EMP KKS	E60 00002 PV 10 FP KE PV 99 17 03 – 33 31 PV 99 99 01	147660
	E60 00005 PV 10 FP KE PV 99 17 03 – 33 32 PV 99 99 01	147760
	E60 00009 PV 10 FP KE PV 99 17 03 – 33 32 PV 99 99 01	147860
	E60 00014 PV 10 FP KE PV 99 17 03 – 33 32 PV 99 99 01	147960

Extent of supply: 2 m connector cable with shock-proof plug, dummy plug for empty signal input, dummy plug for pulse input, dummy cap for empty signal and stroke signal output, 5-pin connection plug for pulse and standard signal input, plug allocation plan, operating instructions, material of hose connection 2/4 mm (0.2 l/h) resp. 4/6 mm (0.5 – 1.4 l/h) for pressure connection; 6/8 mm, 6/10 mm and 6/12 mm for pre-delivery, 2 m duo-hose

**ELADOS[®] EMP KKS E 60^{PLUS}**

With the add-on unit (Dongle Box) for connection of an OGM^{PLUS} oval gear meter the version E 60 turns to version E 60^{PLUS}.

**Dongle Box**

248606

with the following additional functions:

- Automatic readjustment of pump output in combination with an oval gear meter (for operating modes "internal" and "current" only)
- Automatic calibration function via oval gear meter
- Consumption data control by means of oval gear meter

Article

Material-No.



Suction lances D 16 with reserve and empty signal report

incl. ball non-return valve, suction strainer, level pre-warning contact, empty signal contact (when dropping below the level = contact interrupted), hose connection material (4/6 mm, 6/8 mm, 6/10 mm and 6/12 mm)

Tube diameter: 16 mm
 Suction line: PE
 Connection cable: circular connector incl. 5 m cable
 Turn-on voltage: max.48 V AC/DC
 Switching current: 0.5 A
 Rupturing capacity: 8 W / 8 VA

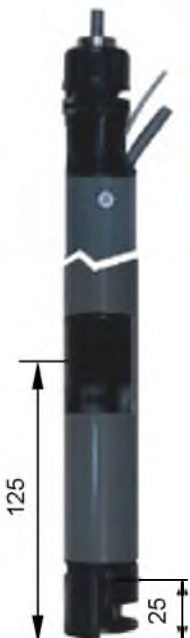
SGL VCPVFP99GL000 G3/8-06-2SS-0540-9951 (for container 20 l)	249020
SGL VCPVFP99GL000 G3/8-06-2SS-0750-9951 (for container 30/60 l)	249021
SGL VCPVFP99GL000 G3/8-06-2SS-0970-9951 (for container 100/200 l)	249022
SGL VCPVFP99GL000 G3/8-06-2SS-1125-9951 (for container 200 l)	249023

Note: When using these suction lances combined EMP KKS please order [suction pipe adapter \(247627\)](#) with return hole

Suction lances D 32 with reserve and empty signal report and return connection

incl. ball non-return valve, suction strainer, level pre-warning contact, empty signal contact (when dropping below the level = contact interrupted) and return connection from PVC

Tube diameter: 32 mm
 Return connection: DN 6
 Connection cable: 3-pin plug incl. 5 m cable
 Turn-on voltage: max.48 V AC/DC
 Switching current: 0.5 A
 Rupturing capacity: 8 W / 8 VA

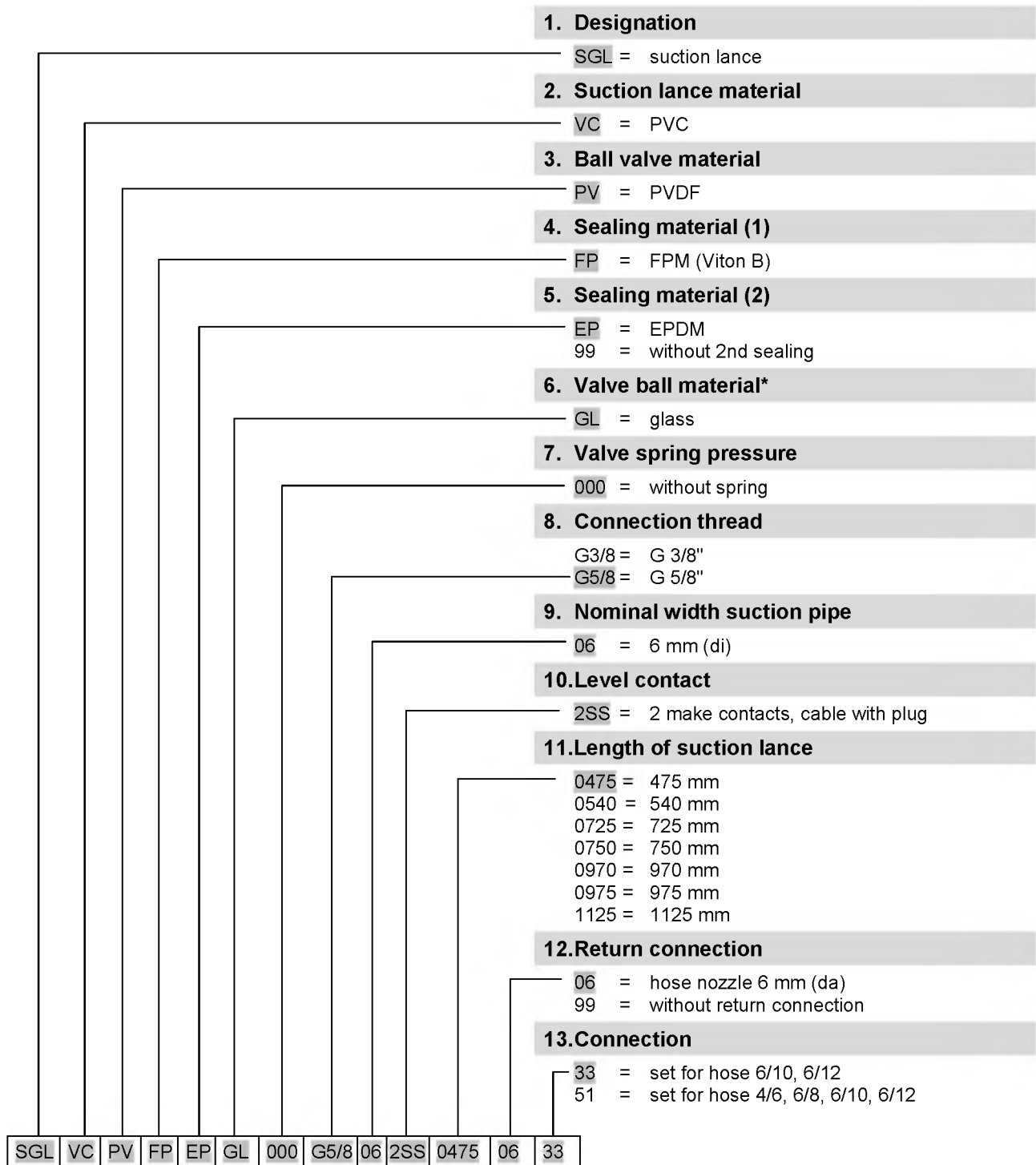


SGL VCPVFPEPGL000 G5/8-06-2SS-0475-0633 (for container 20 l)	247614
SGL VCPVFPEPGL000 G5/8-06-2SS-0725-0633 (f. container 30/60 l)	247615
SGL VCPVFPEPGL000 G5/8-06-2SS-0975-0633 (f. container 100/200 l)	247616
SGL VCPVFPEPGL000 G5/8-06-2SS-1125-0633 (for container 200 l)	247617

Please see next page for suction lance legend.



Suction lance code



* standard valve ball material will soon be changed to ceramics

	Article	Material-No.
	Suction pipe adapter with return hole	247627
	thread pitch: 5 mm thread dimension inside: 56 mm thread dimension outside: 61 mm to screw on: canister 30 l or vessel 60 – 200 l	
	Adapter insert cap	286198
	for suction lance Ø 32 mm PVC soft to attach on: canister 10 l and 20 l	
	Adapter insert cap	288534
	for suction lance Ø 32 mm PVC – hard / Viton B suitable for degassing products Return connection: 4/6, 6/8 or 6/12 mm (int./ext.Ø) Vent connection: 6/12 mm (int./ext.Ø) to attach on: canister 30 l or container 60 – 200 l	
	Adapter screw connection	286197
	for suction lance Ø 32 mm PVC hard Thread pitch: 5 mm Threaded internal diameter: 56 mm Threaded external diameter: 61 mm can be screwed on: canister 30 l or container 60 – 200 l	
	Adapter screw connection	288535
	for suction lance Ø 32 mm PVC – hard / Viton B / Silicon suitable for degassing products Return connection: 4/6, 6/8 or 6/12 mm (int./ext.Ø) Vent connection: 6/12 mm (int./ext.Ø) Thread pitch: 5 mm Threaded int. diameter: 63 mm Threaded ext. diameter: 69 mm for barrel with internal thread (L–ring plus barrel 220 l)	



Article

Material-No.

Adapter screw connection

288570

for suction lance Ø 32 mm
 PVC – hard / Viton B / Silicon
 suitable for degassing products
 Return connection: 4/6, 6/8 or 6/12 mm (int./ext.Ø)
 Vent connection: 6/12 mm (int./ext.Ø)
 Thread pitch: 2.31 mm
 Threaded int. diameter: 56.66 mm
 Threaded ext. diameter: 59.61 mm
 for container screw cap with 2" internal thread



Adapter

41980026

2" internal thread for adapter screw connection **288570**
 Tri-Sure external thread for container screw cap



Protection tubes for suction lances Ø 32 mm

for prevention of mechanical damage of the suction valve
 and the float respectively, incl. fastening screw

Protection tube, **PVDF**

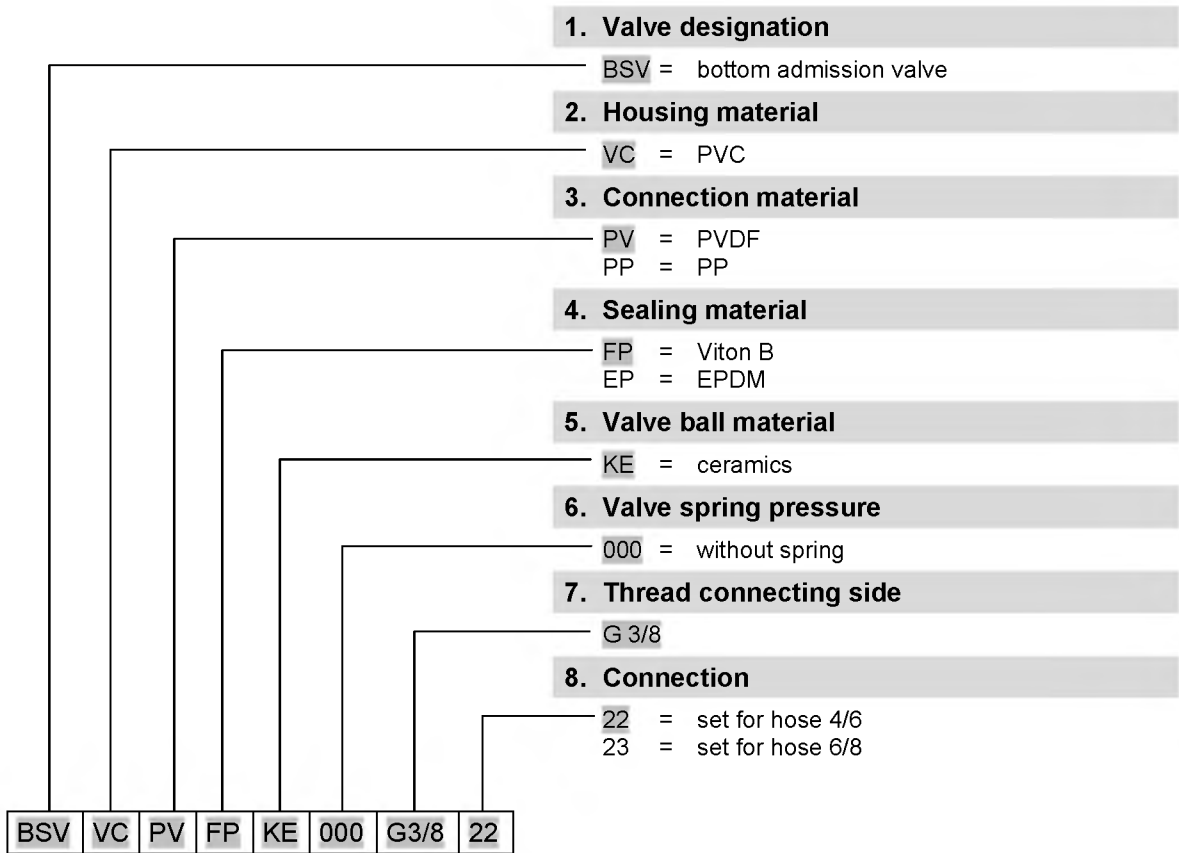
286191

Protection tube, **stainless steel (1.4035)**

286153








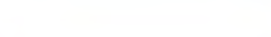






Bottom admission valve



Article

Material-No.

BSV VC PV FP KE 000 G 3/8 - 22	243129
BSV VC PV FP KE 000 G 3/8 - 23	243130
BSV VC PV EP KE 000 G 3/8 - 22	243131
BSV VC PV EP KE 000 G 3/8 - 23	243132
BSV VC PP FP KE 000 G 3/8 - 22	243125
BSV VC PP FP KE 000 G 3/8 - 23	243126
BSV VC PP EP KE 000 G 3/8 - 22	243127
BSV VC PP EP KE 000 G 3/8 - 23	243128

Article	Material-No.
Suction and pressure lines	
available by the metre	
ID/AD [bar]	max. working pressure at 20° C
 PVC-fabric 4/10 mm	16 417400121
 PVC-fabric 6/12 mm	16 417400123
Note: We explicitly point out that PVC fabric tubes have a limited lifetime if alkaline chemicals will be used. To avoid damage for your staff and your company the tubes have to be exchanged at least every 6 months. In case of non-compliance we exclude all kinds of liability and responsibility.	
 PVC-duo-hose (6/10) mm	8 417400701
 PE hose 2/4 mm	20 417400291
 PE hose 4/6 mm	8 417400301
 PE hose 6/8 mm	8 417400310
 PTFE hose 2/4 mm	18 417400209
 PTFE hose 4/6 mm	12 417400215
 PTFE hose 6/8 mm	14 417400224
	Signal horn with integrated red flash light 230 V / 50 Hz / IP 33 RO 418271053
	Wall bracket made of stainless steel 1.4301 incl. attachment parts (dowels and screws) 240606
	Wall bracket made of thermoplastic polyester incl. fastening screws and dowels 207002

Metering monitoring system MicroFlow^{PLUS}

MicroFlow^{PLUS} is only applicable in conjunction with an EMP KKS / EMP II E60 series metering pump. The system consists of: MicroFlow^{PLUS}, measuring sensor and connection cable. The measuring sensor can also be used as a metering valve.

Flow capacity: 0.2 to 13 l/h
Minimum conductivity of product: 100 µS/cm

Article

Material-No.



MicroFlow^{PLUS}

248611

Extension box with „Plug and Play“ function for evaluation of flow pulses

Measuring sensor MicroFlow VC PV FP PT HC TI - 3/8 - 21

288413



Housing:	PVC	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Valve seat/Connection:	PVDF	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Sealing:	Viton B	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Ball:	Teflon	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Spring:	Hastelloy C	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Connector pin:	Titan	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Connection thread:	3/8"	VC	PV	FP	PT	HC	TI	- 3/8 - 21
Connection:	Set for hose 4/6 mm, 6/8 mm and 6/12 mm	VC	PV	FP	PT	HC	TI	- 3/8 - 21

Attention: The measuring sensor has to be installed vertically (arrow faces upwards).



Connection cable MicroFlow

248612

for connection of measuring sensor **288413** at MicroFlow^{PLUS} **248611**

Length: 5 m



Article

Material-No.



Metering pipe G 1/4" for measuring sensor
Material: PVC

34800189

Metering pipe G 1/2" for measuring sensor
Material: PVC

34800190

The MicroFlow measuring sensor in combination with the metering pipe (**34800189** or **34800190**) can be used as a metering valve.

Illustration left: MicroFlow measuring sensor with metering pipe 1/4" in optimal fitting position.



Screw-on connection PVDF

Connection 3/8" straight for hose 2/4 mm (int.Ø/ext.Ø)
For connection of PE- or PTFE hose on "micro flow"

415101999

Note:

In case of pump type 00002 (0.2 l/h) the metering line has to be carried out with 2/4 mm hoses.. For accessories on pressure side (e.g. metering valve) the screw-on connection 415101999 is required.



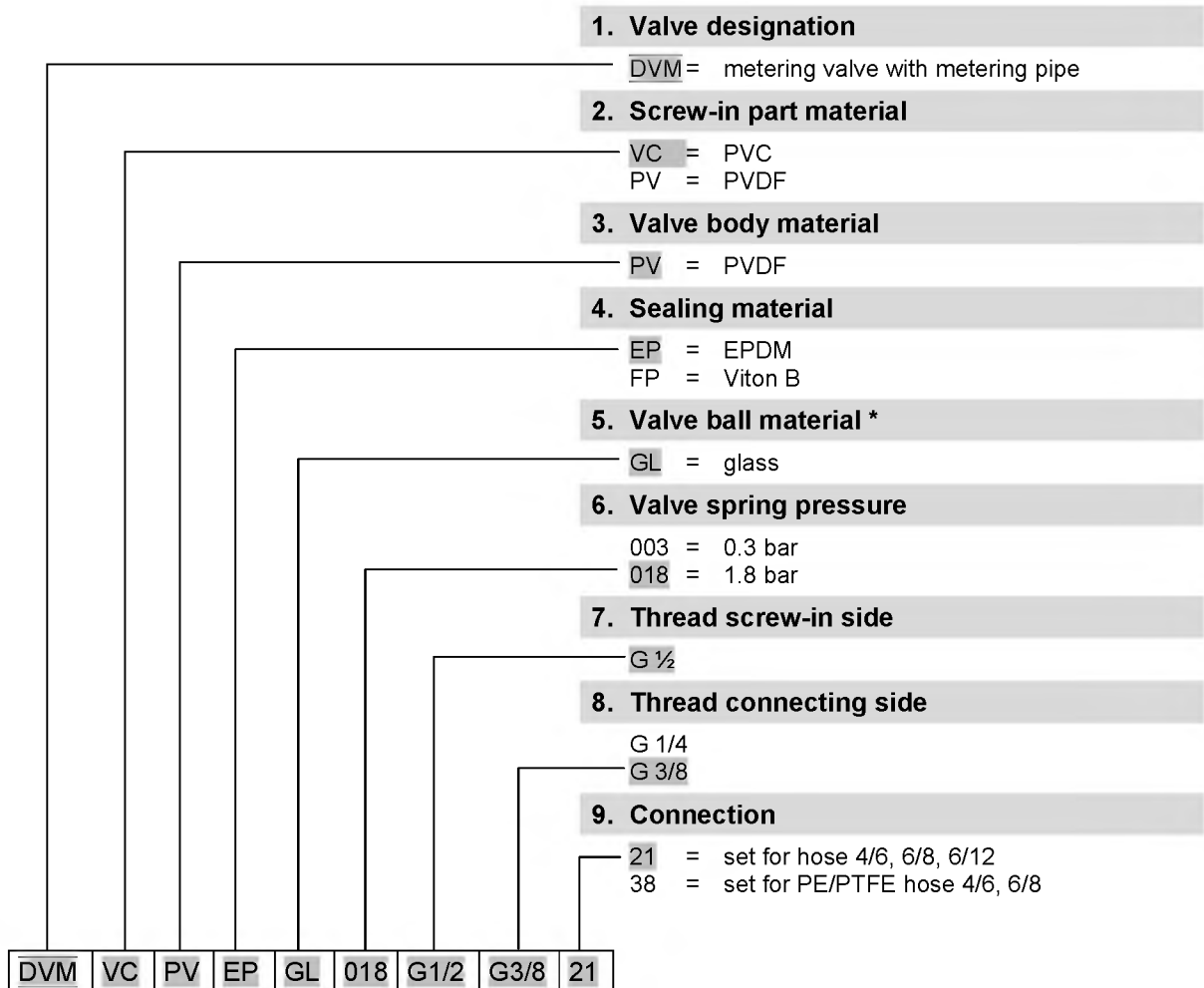
Oval gear meter

for volumetric measurement of the rate of flow

Ordering data are to be found in chapter 6 of "Measuring and Controlling".



Metering valves



DVM VC PV EP GL 018 G1/2 G3/8 21



Article

DVM VC PV FP GL 003 G 1/2 – G 3/8 – 21
 DVM VC PV EP GL 003 G 1/2 – G 3/8 – 21

Material-No.

248059
 248060

* standard valve ball material will soon be changed to ceramics



Article

Material-No.

Metering valves with hose valve for chloric products

Metering pipe length L [mm]: 40

DVM VC PV FP GL 018 G 1/2 – G 3/8 – 21

248022

DVM VC PV EP GL 018 G 1/2 – G 3/8 – 21

248020

DVM PV PV FP GL 018 G 1/2 – G 3/8 – 38

248023

DVM PV PV EP GL 018 G 1/2 – G 3/8 – 38

248021

Connection cables

Length of 5 m each,
ready made up with connectors



for empty signal input with straight 4-pin plug

418439001

for pulse or current input with straight 5-pin plug

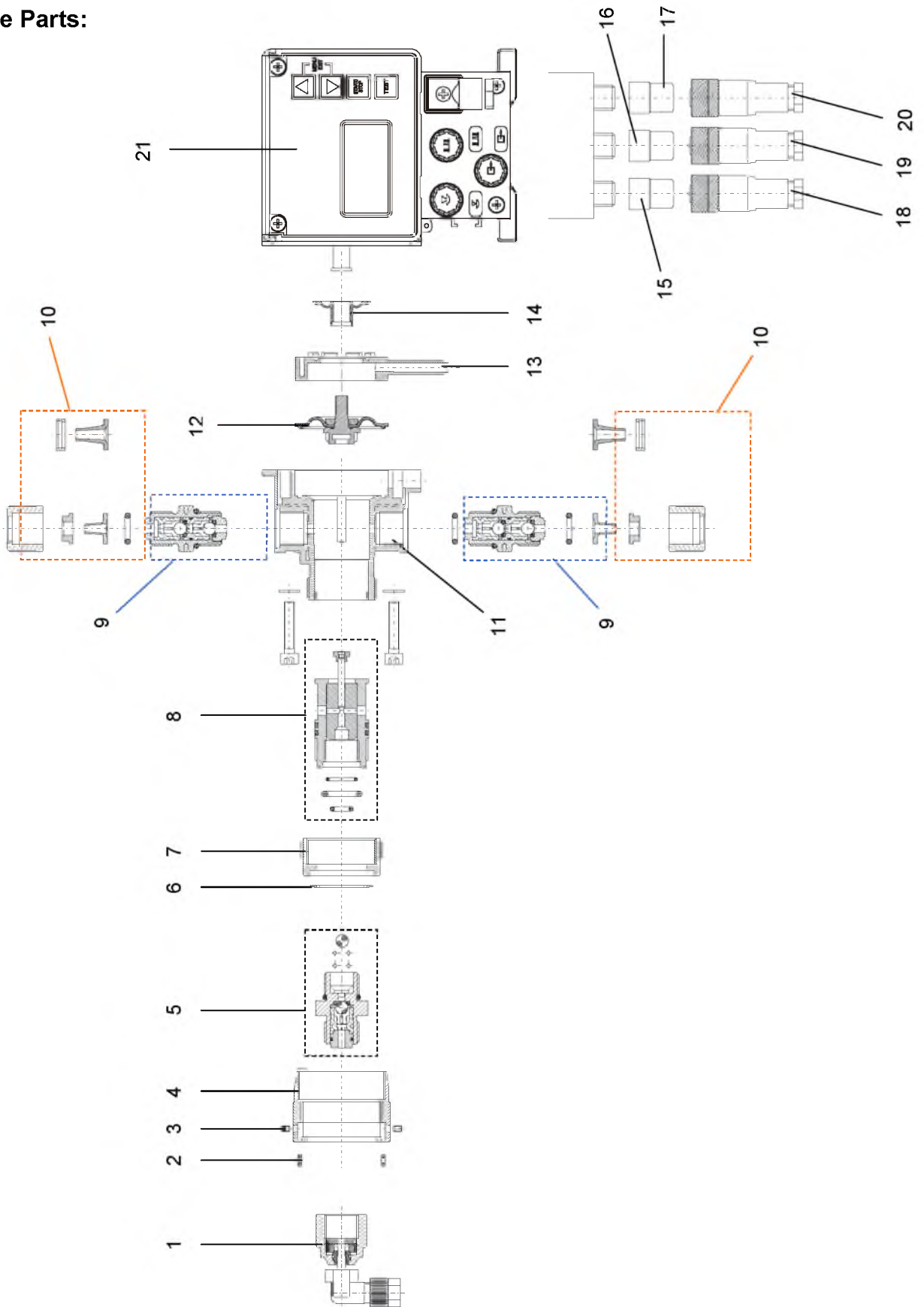
418439007

for empty signal or stroke signal output
with straight 4-pin plug

418439022



Spare Parts:



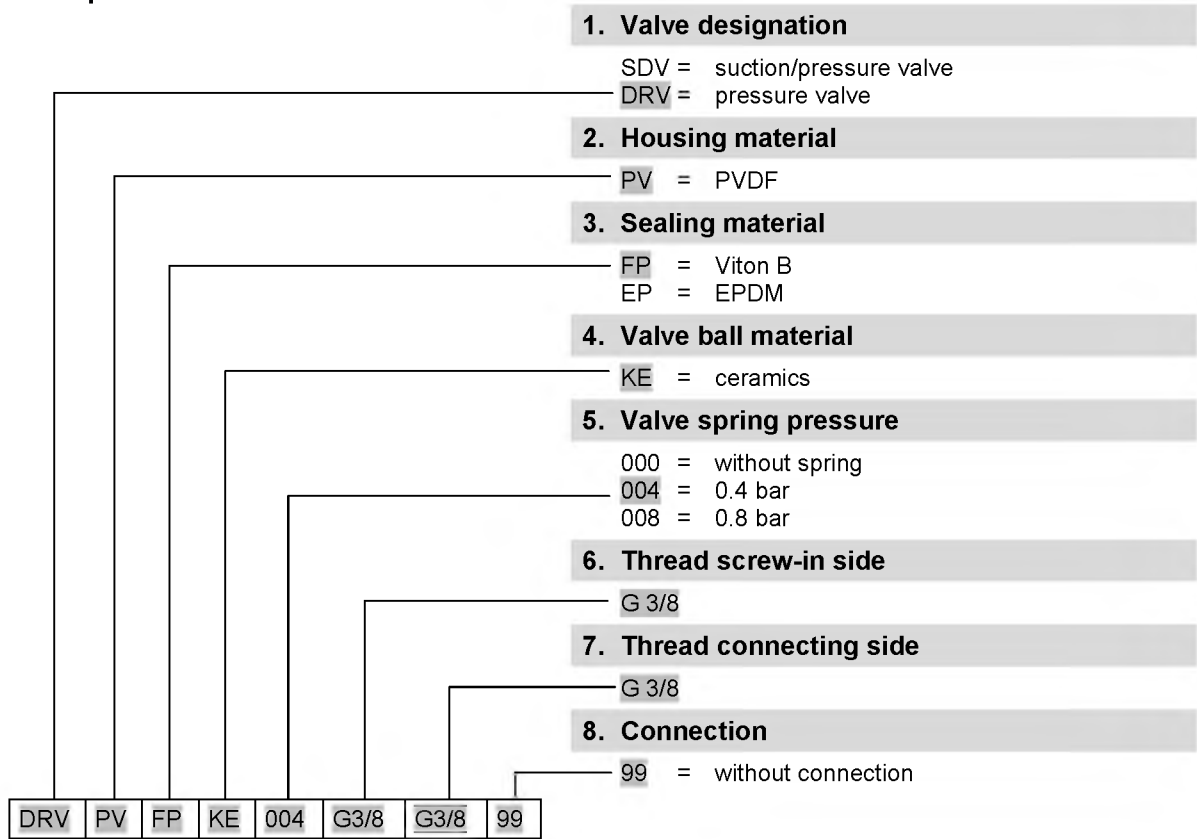


Item-No.	Description	Material-No.
1	Connection set straight G 3/8"-2/4 (for type 00002)	415101999
	Connection set angled G 3/8"-2/4 (for type 00002)	247613
	Connection set straight G 3/8"-4/6 (for type 00005-00014)	247619
	Connection set angled G 3/8"-4/6 (for type 00005-00014)	247620
2	Square nut	413226005
3	Headless screw	413401178
4	Stroke adjustment knob	34070193
5	Pressure valve DRV PVFPKE004 G3/8-G3/8-99 00002*	247623
	Pressure valve DRV PVFPKE008 G3/8-G3/8-99 00005/00009*	247624
	Pressure valve DRV PVFPKE008 G3/8-G3/8-99 00014*	247630
6	Washer	34070186
7	Regulating nut	34070185
8	Cylinder piston unit complete (for type 00002)	247607
	Cylinder piston unit complete (for type 00005)	247609
	Cylinder piston unit complete (for type 00009)	247605
	Cylinder piston unit complete (for type 00014)	247604
9	Suction and return valve SDV PV FP KE 000 G3/8-G3/8-99*	248405
	Suction and return valve SDV PV EP KE 000 G3/8-G3/8-99*	248406
10	Connection set 3/8" PVDF, for hose (int.Ø/ext.Ø) 6/8, 6/10, 6/12 mm	247629
	Connection set 3/8" PVDF, for duo-hose (int.Ø/ext.Ø) 6/10 mm	247610
11	Pump head, PVDF	34070192
12	Coupling/diaphragm unit, complete (for type 00002 / 00014)	247601
	Coupling/diaphragm unit, complete (for type 00005)	247608
	Coupling/diaphragm unit, complete (for type 00009)	247602
13	Intermediate plate	34070173
14	Protection diaphragm (only to change in connection with Pos. 26)	34800132
15	Dummy plug for empty signal report and pre-warning	248186
16	Dummy plug pulse input	248187
17	Cover cap	34800117
18	4-pin plug (3-pin) empty signal and pulse input	418463115
19	5-pin plug current and pulse input	418463118
20	4-pin plug empty signal and pulse output	418463117
21	Transparent enclosure cover	34800120

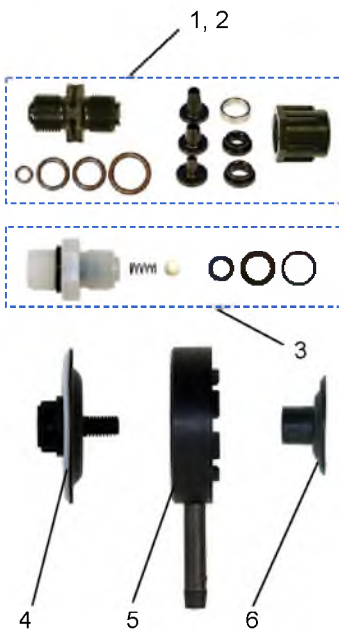
* Please see next page for code declaration.



Suction and pressure valves



Other versions on request!



Set of wearing parts (complete)

consisting of 1 piece each:

- Suction valve (pre-transport) with hose connection – complete (1).
- Pressure valve (return flow) with hose connection – complete (2).
- Metering valve (3, pressure side)
- Diaphragm (4)
- Intermediate plate (5)
- Protection diaphragm (6)

Article

Material-No.

Set of wearing parts

EMP KKS 00002 PV FP KE	247676
EMP KKS 00005 PV FP KE	247677
EMP KKS 00009 PV FP KE	247678
EMP KKS 00014 PV FP KE	247679
EMP KKS 00002 PV EP KE	247686
EMP KKS 00005 PV EP KE	247687
EMP KKS 00009 PV EP KE	247688
EMP KKS 00014 PV EP KE	247689

Valve ball material	KE	= ceramics
Sealing material	FP	= Viton B
	EP	= EPDM
Housing material	PV	= PVDF
Pump type	00002	= 0.2 l/h
	00005	= 0.5 l/h
	00009	= 0.9 l/h
	00014	= 1.4 l/h